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Trends in Psychology

THE ROLE OF LIFE MEANING IN PSYCHOLOGICAL DISTRESS AND POST-TRAUMATIC GROWTH AMONG ITALIAN FIRST-AID VOLUNTEERS DURING THE COVID-19 OUTBREAK

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THE ROLE OF LIFE MEANING IN PSYCHOLOGICAL DISTRESS AND POST-TRAUMATIC GROWTH AMONG ITALIAN FIRST-AID VOLUNTEERS DURING THE COVID-19 OUTBREAK

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Abstract

The coronavirus disease 2019 (COVID-19) pandemic has been a sudden and disruptive event that has produced lots of deaths, overload of the health-care system, interruption of social habits and change in life prospective. The study aimed to explore the relationships between meaning of life, psychological distress, and post-traumatic growth in volunteers from the First Aid Associations operating in Italy belonging to the areas most affected by the pandemic (Bergamo, Brescia, and Parma). Our hypothesis anticipated that the meaning of life can mediate the relationship between psychological distress and post-traumatic growth. We, also, expected that this effect could vary with the role played in the rescue team, the increased shifts' amount, and the monetary incentive. Using a cross-sectional design, a convenience sample of 268 consenting participants completed Depression, Anxiety and Stress Scale (DASS-21), Post-Traumatic Growth Inventory (PTGI), and Personal Meaningful Profile-Brief (PMP-B).

Findings yielded a positive relationship between psychological distress and post-traumatic growth

($r=.284$). Regarding the meaning of life, Spearman's correlation revealed that the two dimensions of "Self-Transcendence" and "Religion" are moderately involved in the post-traumatic change (specifically, "New Possibilities" $\rho=.237$, "Personal Strength" $\rho=.252$, and "Spiritual Change" $\rho=.373$). Logistic regression failed to show any effect concerning role, shifts' amount, and distress level. Finally, the monetary incentive appeared not influencing the altruism's propension.

Even though our findings should be interpreted with caution, this study provides evidence for the relevance of meaning of life to understanding of resilience and promoting the well-being of workforce following traumatic experiences.

KEYWORDS: COVID-19, Psychological distress, Meaning of life, Post-traumatic growth, First-aid volunteer.

STATEMENTS AND DECLARATIONS

Competing Interests

All authors declare no conflict of interest.

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Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The present study was approved by the Ethics Committee of Area Vasta Emilia Nord - AVEN (1301/2020/OSS/UNIPR 15/04/2021). Written informed consent for participation was required for this study in accordance with the national legislation and the institutional requirements.

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[Click here to view linked References](#)

1. INTRODUCTION

The coronavirus disease 2019 (COVID-19) global pandemic has caused a colossal emergency with dramatic concerns in the health, economic and psychological grounds. Italy was the first European country to face the virus, particularly in the northern Italy as the region of Lombardia, which suffered the highest number of infections and deaths during the Covid outbreak between March-May 2020 (Istituto Superiore di Sanità, 2020). To prevent and constrain the spread of infections, the government has set up a two-months quarantine period establishing several social norms such as the use of facial masks, frequent hand washing, and interpersonal distancing; most of the work activities are remotely shifted, and social events were suspended as never before. Lockdown measures were determined by the Government to contain the infection rate and applied first to the so-called “red zone” (Lombardia and 14 provinces of Veneto, Emilia Romagna, Piemonte and Marche) and then to the whole country (Decreto del Presidente del Consiglio dei Ministri, 9 March 2020). Exposure to a potential traumatic event can unleash a cascade of negative reactions including anxiety, depression, and Post-Traumatic Stress Disorder (PTSD). Fear of contagion and social confinement have brought symptoms such as anxiety, worries, post-trauma stress, depression, and sleep deprivation (Huang & Zhao, 2020; Serafini et al., 2020; Wang et al., 2020) impairing the psychosocial functioning and the adaptation to daily living (Nguyen et al., 2020; Wang et al., 2020). The impact of COVID-19 pandemic was explored through its relationships with sociodemographic characteristics, pre-existing psychological concerns, availability of medical resources, and prevention/control measures put into action against the epidemic (Qiu et al., 2020; Wang et al., 2020). It was also suggested that personality influence behaviours in the context of infectious disease or pandemic (Bacon & Corr, 2020) indicating that people experienced psychological conflict between the urge to stay safe and the desire to maintain a normal life. In the general population (Delmastro & Zamariola, 2020; Mazza et al., 2020; Wang et al., 2020) women exhibited increased anxiety, depression, and stress levels rather than men. Long

1 duration of quarantine was associated with poor mental health specifically, post-traumatic stress
2 symptoms, avoidance behaviors, and anger. Some studies have indicated long-lasting effects (Brooks
3 et al., 2020). Health care workers, threatened by an unknown, very contagious, and lethal infection,
4 and often in conditions of overwhelming workload, depletion of personal protection equipment (PPE)
5 and lack of particular drugs forced to make decisions about the patients' life and death (Lai et al.,
6 2020; Tan et al., 2020) revealed symptoms of depression, anxiety, insomnia, higher risk perception,
7 level of worry, and distress, particularly among women, nurses and front-line workers directly
8 engaged in diagnosing, handling, or providing care to patients (Simione & Gagnarella, 2020).
9

10 On the other hand, quarantine and self-isolation may have offered time to resuscitate values, needs
11 and aspirations, in that the traumatic events may have promoted a larger contact with their own
12 spirituality, encouraging the expression of emotions, empathy, compassion, and altruism (Belfroid et
13 al., 2018; Milstein, 2019; Phua et al., 2005). From this perspective, it can be believed that potentially
14 traumatic events have the potential to catalyze a host of positive reactions, including improvements
15 in personal, interpersonal, and spiritual functioning, yield positive consequences in terms of
16 resilience, post-traumatic growth, and meaning of life. Post-traumatic growth is the subjective
17 experience of positive psychological change registered by a person because of struggling with a
18 traumatic event (Tedeschi, 1999). A consequence, often deemed as an element of growth, is the
19 establishment of a new "meaning of life". Personal meaning is designed to include five components:
20 affective, motivational, cognitive, relational, and personal (Wong, 1989). The first Meaning
21 Management Theory (Wong, 2007) argues that individuals can accomplish the various processes
22 related to meaning to meet the survival need and happiness, through the defensive disposition or the
23 pro-active one. Those prefer the positive stance, contrarily to those who choose the defensive one,
24 would be willing to cope the crisis creating opportunities for personal growth with the aim to achieve
25 certain significant life goals, such as competencies, self-efficacy, creativity, or purpose. Meaning of
26 life involves the understanding of existence and experience, and the degree of personal satisfaction
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with life and it is also expressed in having aims, purposes, or mission towards which the individual directs his/her efforts (García-Alandete et al., 2013; Prieto-Ursúa & Jódar, 2020).

Research aimed to a deeper comprehension of how individuals characterize and redefine their personal meaning of life across a traumatic event such a pandemic is still lacking. Recently the occurrence of post-traumatic growth during COVID-19 was associated with meaning, religiosity, and spirituality (Prieto-Ursúa & Jódar, 2020). It was showed that even in traumatic life-events it is possible to find sources of growth. Among the experiential factors, having been exposed to death predicts a better personal and social growth. As for the meaning, it emerged that having life purposes, and strive to achieve our goals are associated with posttraumatic growth and a more valuable, intimate consideration for life.

The COVID-19 outbreak involved powerfully the first-aid volunteers rescuers who played critical roles in the response to the pandemic as they assisted patients suffering from the virus disease and all the emergency users, moved infected patients from a hospital to another because of the overcrowding, transferred oxygen cylinders to home-care patients or carried drugs and groceries to elderly and lonely individuals in quarantine. Volunteers, even during previous pandemic, such as Ebola in 2013, exhibited bravery and altruism, and it was clear that altruism is one of their motivational traits (Belfroid et al., 2018). To our knowledge, no investigation to date has examined the impact of COVID-19 pandemic among first-aid volunteers in Italy. Currently none of existing studies address the relationship between helping and meaning of life in situations similar to the current pandemic during which helping puts the helper at great personal risk. Thus, investigation on resilience factors and resources that are associated with mental distress during the recent COVID-19 pandemic will offer relevant insights for dealing with future crises. Because life meaning is a core psychological construct to promote career calling, and positive affect also is a protective factor, some research considered it an important investigation area to explore the interaction in determining positive psychological outcomes. Basing on the broaden-and-build theory, positive emotions can broaden

1 people's thought-action repertoires progressively building enduring personal resources with long-
2 term adaptive benefits (Fredrickson, 2013). Career calling has regarded as an important index of
3 personal flourishing and eudaimonic well-being (Brown & Lent, 2016; Leffel et al., 2018).
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5 Particularly in times of crisis, meaning in life has been regarded as a crucial factor of resilience and
6 coping ability. Meaning can be tried as present, i.e., meaningfulness; as absent without ensuing
7 search, that is existential indifference. Meaningfulness is the fundamental trust that life is worth living
8 (Schnell, 2020). It is based on an evaluation of own life as coherent, significant, and belonging.
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10 Individuals with a high sense of meaningfulness are more optimistic and hopeful than individuals
11 who feel little meaning in their lives (Ferguson et al., 2017). They showed high degrees of self-
12 efficacy, self-compassion, and resilience. Meaningfulness is strongly related with lower mental
13 distress. This suggests that meaning of life may be a safe existential foundation that allows people to
14 evaluate stressors more as a convenient challenge rather than as harm or loss, even when some pillars
15 of identity break away in times of crisis.

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17 Thus, this research aimed at exploring the mental health burden of the Italian first-aid volunteers
18 (including the Italian Red Cross, Public Assistance, and other voluntary entities of rescue and
19 assistance) operating in the areas of Northern Italy most affected during the first pandemic peak,
20 responds therefore to the call for studies of outcomes of exposure to traumatic event also investigating
21 how meaning of life, distress, work together to correlate with post-traumatic growth. Recent studies
22 concerning COVID-19 showed different mediating roles of stress, meaning-making, and personal
23 resources with the cognitive and affective dimensions of subjective well-being in general population
24 and healthcare workers (Krok et al., 2021; Mo et al. 2021; Schnell & Krampe, 2020). As the risk of
25 contracting COVID-19 among healthcare workers is relatively high and unpredictable, it can give
26 raise to intense distress that affects cognitive and affective responses. Given that health context is an
27 extreme risky and dangerous condition, it is plausible that level of stress would determine widespread
28 consequences on well-being. Our hypothesis anticipated that the meaning of life can mediate the

1 relationship between psychological distress and post-traumatic growth. By offering individuals
2 important goals and values, enabling them to reinterpret their life experiences and directing their
3 energies, meaning in life can noticeably influence the ways in which workers deal with stress and
4 maintain their efficiency. Namely, compared to volunteers with weak meaning of life, post-traumatic
5 growth may be more closely related to lower distress for those with intense meaning of life. Given
6 that the COVID-19 pandemic is a prolonged stressful situation, particularly for those who operate in
7 the context of healthcare, the availability of meaning in life would enable the workers to manage
8 stress and encourage positive functioning and post-traumatic growth. Therefore, basing on the
9 existing research presented earlier, we assume that disposition to altruism and job characteristics
10 plays a role in adjustment outcomes. We hypothesized that greater disposition to altruism would be
11 associated with lesser distress and higher post-traumatic growth. We also anticipated that job factors
12 such as the role and the shifts number would potentially influence psychological distress, without any
13 definite hypothesis on the direction of influence.
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32 **2. METHODS**

33 **2.1 Recruitment**

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36 To include a broader range of experiences, the study used purposive heterogeneous sampling as well
37 as convenience sampling strategies - for instance, referral from other participants. Volunteers were
38 mainly reached through contact and collaboration with managers of the first-aid Associations (such
39 as Italian Red Cross, Public Assistance and Federation of Rescue Volunteers), who were invited to
40 spread to their staff online survey in the type of Quick Response code (QR code) or the relevant link
41 for response. The study also used flyers and web presentations at various collaborating organizations
42 sites in Brescia, Bergamo, and Parma to recruit participants obtaining permission from the authorities,
43 and then posted flyers. We thus used a kind of convenience sampling with the aim of addressing as
44 many different individuals as possible. Participation was voluntary, without compensation and could
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1 be terminated anytime. To be included, participants had to fulfill the following criteria: i) age > 18
2 years at the time of inclusion, ii) stable residence in Bergamo, Brescia, or Parma, iii) belonging to a
3 first-aid Associations. They were asked to scan the QR code and complete the online questionnaires
4 after signing the informed consent to participate in the study.
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10 **2.2 The survey**

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12 Due to the special nature of the period which prevented to conduct investigations meeting participants
13 face-to-face, a self-reporting methodology was employed. To assess associations between
14 psychological distress, post-traumatic growth, and personal meaning of life during the COVID-19
15 first pandemic peak, a web-based cross-sectional survey was scheduled using the software Google
16 Moduli. Before being able to answer the questions, respondents were provided detailed information
17 concerning the study aims, instructions and informed consent. They were informed that their
18 involvement into the study was completely voluntary, and they were free to withdraw at any time.
19 Data were anonymous (anonymity was guaranteed by an identification code) and were treated
20 according to Italian law concerning general data protection. All participants expressed their informed
21 consent by explicitly agreeing to continue with the questionnaire after being informed about the
22 study's aims, employed data protection, participants' rights and contact for questions or details.
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42 **2.2 Ethics**

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44 The research protocol was approved by the local Ethics Committee, and it was conducted in
45 accordance with the ethical standards of the Helsinki Declaration and signed informed consent was
46 obtained from all the participants. By agreeing to participate in the study, participants declared to
47 have voluntarily chosen to take part in the research, to have understood the study aims described in
48 the information form leading the questionnaire completion, and to have been informed about the
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1 guarantee of privacy and anonymity. Electronic informed consent was obtained from everyone prior
2 to starting the survey.
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5 **2.3 Study design**

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8 The present research adopted a correlational design to assess the first-aid volunteers' psychological
9 response during the initial stage of the COVID-19 pandemic together with their relationship with the
10 measured constructs (meaning of life, psychological distress, and post-traumatic growth) and their
11 specific dimensions investigated.
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18 **2.4 Data collection**

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20 Data collection was conducted between May 1 and July 30, 2020 to collect the immediate reactions
21 to the emergency. Clicking the link or the QR-Code provided, first appears the informational sheet
22 that explained that a study examining the psychological factors related to life experiences in
23 volunteering during the COVID-19 pandemic was being conducted by university academics and
24 participants are asked to give informed consent if they agree to participate in the study. After, the
25 survey began with questions about demographic data, COVID-19 related information and
26 volunteering related information, followed by formalized measures.
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42 **2.5 Measures**

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44 *2.5.1 Socio-demographic questionnaire.* A questionnaire COVID-19-related experience was
45 developed to record respondents' socio-demographic, job-related characteristics, and COVID-19
46 experience. Authors compiled a first list of items that was revised by four experts (medical doctors
47 and psychotherapists) to remove, modificate, or add relevant items. It was composed by three
48 sections. The first part contained sociodemographic information such as gender, age, nationality, civil
49 status, education, occupation, and number of family members. In the second section participants were
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1 required to refer their experience with COVID-19 (in particular, contact with suspected or confirmed
2 cases, symptomatology, use of the regional toll-free number, access to the medical clinic or the
3 emergency room or need for hospitalization, administration of diagnostic tests, confirmed positivity
4 and home quarantine, positivity, home quarantine and death of one or more family members or
5 friends). The third section included questions about participant's practice of volunteering:
6 association's location (Bergamo, Brescia, or Parma), functions accomplished during the pandemic
7 and reasons, role played into the association (status, years of service, number of shifts during the
8 epidemic).
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21 *2.5.2 Psychological distress.* The psychological distress was evaluated through the "Depression
22 Anxiety Stress Scale - Short Version" (DASS-21) (Henry & Crawford, 1995). The DASS-21 is one
23 of the most widely used psychometric tests for the assessment of distress along the three axes of
24 depression, anxiety, and stress. It consisted of a list of twenty-one items, 7 items per subscale
25 assessing how often the participant experienced symptoms of depression (e.g., "I felt I wasn't worth
26 much as a person"), anxiety (e.g., "I felt I was close to panic"), and stress (e.g., "I found it hard to
27 wind down") across the past week. Subjects are requested to score every item on a scale from 0 ("Did
28 not apply to me at all") to 3 ("Applied to me very much"). Sum scores are computed by adding up
29 the scores on the items per (sub)scale. Sum scores for the total DASS-total scale thus range between
30 0 and 63 and those for each of the subscales may range between 0 and 21. Cut-off scores of 4 for
31 depression, 3 for anxiety and 7 for stress differentiate a normal score from one worthy of attention.
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2.5.3 Post-traumatic growth. The post-traumatic growth was explored with the "Post-Traumatic
Growth Inventory" (PTGI) (Tedeschi & Calhoun, 1996). The PTGI is the most common self-reported

1 approach to measuring post-traumatic growth and contained 21 items assessing the positive changes
2 experienced in the aftermath of a traumatic or stressful event. The items are rated using a 6-point
3 Likert scale with values ranging from 0 (“I did not experience this change as a result of my crisis”)
4 to 5 (“I experienced this change to a very great degree as a result of my crisis”). The affirmations
5 evaluate the five dimensions of post-traumatic change: relationships (e.g., “I have a greater sense of
6 closeness with others”), new possibilities (e.g., “I established a new path for my life”), personal
7 strength (e.g., “I know better that I can handle difficulties”), spiritual change (e.g., “I have a better
8 understanding of spiritual matters”) and appreciation for life (e.g., “I have a greater appreciation for
9 the value of my own life”). Sum scores are computed by adding up the scores on the items per
10 (sub)scale. The total score of the PTGI ranged from 0 to 105 (Prati & Pietrantonio, 2014). The
11 inventory does not provide a cut-off score: the higher the result, the higher the level of post-traumatic
12 growth. Our study applied the validated version for the Italian population (Prati & Pietrantonio, 2014)
13 in which the scale showed a strong internal consistency reliability in Italian sample (Cronbach’s alpha
14 = 0.93).

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34 *2.5.4 Meaning of life.* The meaning of life was assessed through the questionnaire “Personal
35 Meaningful Profile-Brief” (PMP-B) The PMP-B (Macdonald, Wong, & Gingras, 2012) is a 21-item
36 instrument which has much utility for research involving personal meaning. It was developed from
37 the longer 54-item PMP (Wong, 1998). The questionnaire is intended to identify what really matters
38 in people’s life measuring the personal meaning that respondents feel in their lives. The seven
39 subscales of PMP-B are as follows: achievement (e.g.), relationship (e.g.), religion (e.g.), self-
40 transcendence (e.g.), self-acceptance (e.g.), intimacy (e.g.), and fair treatment (e.g.). The affirmations
41 are rated using a 7-point Likert scale with values ranging from 1 (none) to 7 (most). The questionnaire
42 does not provide a cut-off score: the higher the result, the more important is the meaning given to life.
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and validated by a focus group of homologous participants and feedback from key informants. Due to the lack of adaptation and validation of the instrument in the Italian population, to obtain a total score, we have applied the same methodology used for the PTGI, through which the total score indicator derived from the sum of the single subscales scores.

2.6 Data analysis

To ensure the quality of the survey, we excluded 24 responses because of duplicate data and one individual who did not give the consent. Finally, a total of 268 participants who completed the questionnaire were included in the analysis. Job characteristics of interest (status in Association, role played and number of shifts) were classified as categorical variables. Before the main analyses, several preliminary analyses were performed to describe all the variables examined in the survey. To statistically compare the scores from the three questionnaires, we adopted the 75th percentile as the cut-off useful to dichotomizing the variables. Single DASS-21 subscales scores were dichotomized into two levels, “Normality range” and “Potentially pathologic” according to the cut-off established at the 75th percentile. As for Depression subscale, scores ≤ 4 are considered being in the normality range and ≥ 5 as potentially pathological, for Anxiety subscale scores ≤ 3 are evaluated as typical and ≥ 4 as potentially pathological, for Stress subscale scores ≤ 7 are considered typical and ≥ 8 as potentially pathological. PTGI subscales scores were dichotomized into “Normal” and “Above normality” (higher indicates a deep post-traumatic change) according to the 75th percentile cut-off, so for the “Relationship” subscale scores ≥ 15 are considered above normality, for “New possibilities” and “Personal Strength” subscales scores ≥ 10 are higher, for “Spiritual Change” subscale scores ≥ 2 are above normality, and for “Appreciation of Life” ≥ 8 are higher. Finally, following the same principle, also the PMP subscales scores were dichotomized into “Normal range” and “Above normal range”. Thus, for the “Achievement” subscale scores ≥ 18 are above normal range, for “Religion” subscale scores ≥ 13 are above, for “Relationship” subscale scores ≥ 19 are evaluated as above normal

1 range, for “Self-Transcendence” and “Self-Acceptance” subscales scores ≥ 17 above, for “Intimacy”
2 subscale scores ≥ 20 above and, finally, “Fair Treatment” subscales scores ≥ 16 are considered above
3 normality.
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6 Pearson’s r correlational analysis was carried out to examine whether psychological distress was
7 associated with post-traumatic growth, and Spearman’s analyses to determine whether Distress
8 (measured by the DASS-21) and Post-Traumatic Growth (assessed by the PTGI) singularly, were
9 associated to Meaning of life (evaluated by the PMP-B).
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11
12 Among all the variables investigated through the socio-demographic questionnaire, we are interested
13 in the impact of the role played in the Association (rescuer, team leader, driver and administrative)
14 and the shifts’ number. We firstly performed a descriptive analysis to point out the mean scores (95%
15 CI) of each dimension stratified by role. Then, we explored the association between “Role” and both
16 DASS-21 total and dimensions’ scores (dichotomized as already indicated) through chi-squared test
17 which produced any significant result. Consequently, we had not proceeded to the creation of a
18 univariate AN.o.VA. model to further explore potential causality relationships between the variables.
19
20 The same procedure applied for evaluating the association with the “Shifts’ amount” did not produce
21 significant result.
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23
24 To statistically analyze the anticipation about the effect of the monetary incentive, we compared
25 volunteers and employees on the “Altruism” dimension from the PTGI through the independent-
26 sample t-test. Statistical significance was defined as $p < .05$. All data were analyzed using Statistical
27 Package for Social Sciences (SPSS) version 26.0 (IBM Corp.) and software RStudio, version 4.0.2.
28 (R Core Team, 2014).
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33 **2.7 RESULTS**

34 **2.7.1 Characteristics of respondents, socio-anamnestic information, and COVID-19 experience**

1 The respondents' final sample included 268 participants. Descriptive statistics and correlations for all
2 study variables are presented in Tables 1-2. One hundred and fifty of respondents (56%) self-
3 identified as females. The participants' mean age was 37.16 years (SD = ± 14.10) within a range from
4 18 to 77 years. More than half of the sample (n=148, 55.2%) was undergraduate with a high school
5 degree, and currently employed (n=182, 67.9%). Marital status was mainly represented by singles
6 (n=93, 34.7%). Concerning their COVID-19 experience, 224 (83.6%) of the respondents had a
7 contact with a suspected case of infection and 191 (71.3%) with a confirmed one. In the whole sample,
8 66 individuals (24.6%) had symptoms compatible with COVID-19 disease (e.g.: fever, cough,
9 breathing difficulty, sore throat, and asthenia) 47 (17.5%) were tested for the virus and 31 (11.6%)
10 were quarantined. Only 8 (3%) respondents have reported to have been affected by the virus and, of
11 these, only half have been quarantined, probably because they did not suspect to being infected,
12 discovering it only later. As of the infection, 15 respondents (5.6%) declared to have had at least one
13 family member been infected and 13 (4.9%) at least one who died; concerning friend, 250 respondents
14 (93.3%) declared to have had at least one friend been infected and 209 of the sample (78%) reported
15 at least the death of a friend.

16 Considering the experience of volunteering, 165 respondents (61.6%) worked in Brescia, 74 (27.6%)
17 in Parma, and 29 (10.8%) in Bergamo. Roughly the entire sample is represented by volunteers (n =
18 241, 89.9%) and only a small part from employees (n = 27, 10.1%). As for the role, half of respondents
19 are rescuers (n = 134, 50%), followed by team leaders (n = 80, 29.9%), drivers (n = 41, 15.3%) and
20 administrative (n = 13, 4.9%). During the first pandemic peak (March-May 2020) most of respondents
21 (n = 61, 26.4%) carried out more than 20 shifts. In the whole sample, 236 respondents (88.1%) had
22 worked during the outbreak and, of these, 116 (49.15%) they were involved in different tasks than
23 usual (e.g.: bring drugs and duties to quarantined people, aiding in hospitals or bring oxygen cylinders
24 to home-care patients). On the other side, 32 respondents (11.9%) had not worked during the outbreak

1 either for personal choice (n = 22, 68.75%) or as precautionary rule by the Association (n = 9,
2 28.12%).
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6 **2.7.2 Psychological distress, Post-Traumatic Growth, and Meaning of life**

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8 The DASS-21, PTGI, and PMP mean scores (M) and standard deviations (SD) are reported in Table
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10 1. The composite DASS-21 score (M = 10.78, SD = ± 9.17) was at the normal level with similar
11 patterns for the subscales scores as in the non-clinical sample from the Italian adaptation (Bottesi et
12 al., 2015). Concerning the PTGI that evaluates the positive changes experienced in the aftermath of
13 a traumatic event, the participants overall showed a mean PTGI total score of 27.87 (SD = ± 21.40).
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15 The results revealed that levels for all subscales were within the mean range. As far as the Personal
16 Meaningful Profile-Brief, the average total (M = 94.25; SD = ± 20.73) and subscales scores were
17 around 15 or above, comparably to the original authors' findings (McDonald, Wong & Gingras,
18 2012).
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32 **2.7.3 Relationships between Psychological Distress, Post-Traumatic Growth and Meaning of** 33 **Life.** 34 35

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37 A full zero-order correlation matrix was created for a preliminary analysis of the main variables this
38 study is concerned with (see Table 2). The first hypothesis in this investigation concerned the role of
39 Meaning in Life in the relationship between Distress and Post-Traumatic Growth. The assumption
40 predicted that Meaning of Life would have a stronger positive relation with Post-Traumatic Growth
41 and negative with Distress. Results partly confirmed this hypothesis. As showed in Table 2, Pearson
42 correlation analysis showed that DASS-21 total score was positively correlated with PTGI total score
43 (r = .284, p <.01). Higher scores of DASS-21 depression subscale relates to higher ones in the PTGI
44 dimensions of “Relationships” (r = .283, p = <.001), “New Possibilities” (r = .212, p = <.001) and
45 “Appreciation of Life” (r = .206, p = <.001). Higher scores of DASS-21 anxiety subscale relates to
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1 higher ones in the PTGI dimensions of “Relationships” ($r = .349, p = <.001$), “New Possibilities” (r
2 $= .278, p = <.001$), “Personal Strength” ($r = -.232, p = <.001$) and “Appreciation of Life” ($r = .235, p$
3 $= <.001$). Finally, higher scores of DASS-21 stress subscale relates to higher ones in the PTGI
4 dimensions of “Relationships” ($r = .289, p = <.001$) and “New Possibilities” ($r = .218, p = <.001$). The
5 DASS-21 total score was negatively related to PMP total score ($\rho = -.142, p = .019$), but the extent
6 of this correlation is statistically negligible; all the correlations between DASS-21 subscales and PMP
7 ones are statistically negligible. The PMP total score is related to the PTGI one ($\rho = .141, p = .020$)
8 but the extent of this correlation is statistically negligible. However, the PMP subscale of “Self-
9 Transcendence” (PMP-ST) is significantly related to the Post-Traumatic subscales of “New
10 Possibilities” (PTGI-NP) ($\rho = .237, p = <.001$) and “Personal Strength” (PTGI-PS) ($\rho = .252, p =$
11 $<.001$), and the PMP “Religion” subscale (PMP-R) is linked to the “Spiritual Change” from Post-
12 Traumatic Growth Inventory (PTGI-SC) ($\rho = .373, p = <.001$).

13 A logistic multiple regression with several continuous predictors was employed to determine whether
14 Meaning of Life dimensions are better predictor of how participants may experience a Post-Traumatic
15 Growth. All prerequisites of the model are respected. The model combining these facets showed that
16 collectively all subscales of the PMP explain 9% of the total PTGI score ($R^2 = 0.092, R^2 \text{ adjusted} =$
17 0.067). Specifically, the subscales that are most significant related to this score are “Intimacy” ($p =$
18 <0.027) and “Self-Transcendence” ($p = <0.024$).

2.7.4 Association between psychological distress and exposure to the outbreak

19 DASS-21 subscales scores were dichotomized into two levels, “Normal range” and “Potentially
20 pathologic” according to the cut-off established at the 75th percentile. Results of estimated prevalence
21 of Depression, Anxiety and Stress collapsed by Job role during COVID-outbreak are displayed in
22 Figure 1. In Table 3 mean scores (\pm SD) of Distress in the entire sample are shown, together with that
23 of Depression, Anxiety, Stress stratified by role (Team leader, Rescuer, Driver and Administrative),
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and Chi-squared statistics. Rescuers reported higher mean scores in all the three psychological distress dimensions. We tested the association between each subscale and the role played into the association during pandemic by the chi-squared test (χ^2). We have initially assumed that a more exposed role, such as that of Rescuer or Team leader, is associated with higher levels of psychological distress.

Findings suggested that the role isn't significantly associated with higher levels of depression, anxiety, stress, or general distress exemplified by the DASS-21 total score (see Table 3). The absence of any association among variables has made it unnecessary to proceed with a regression model.

As for Psychological distress and Number of shifts, 37 responses were excluded from the analysis because they belonged to individuals not in duty during the first pandemic peak. Therefore, only 231 responses were analyzed. As shown in Table 4, from the descriptive analysis no clear relationship emerged between the Number of shifts and scores reported at the DASS-21 subscales. Contrary to the expectations, the highest average scores are found in the lower range of shifts.

Then we tested the association between each DASS-21 subscale and the variable "Number of shifts played", assuming that a greater number of shifts are associated with higher levels of distress. We used the chi-squared test (χ^2), and results of it are shown in Table 4. As can be seen, the Number of shifts is not associated with higher levels of Depression, Anxiety, Stress neither with the general distress exemplified by the DASS-21 total score. As for the Role, also in this case, we have not continued with regression analysis.

2.7.5 Correlation between altruism and remuneration

To investigate the propensity to Altruism among Volunteers and Employees, we have considered PMP scores referred to the subscales "Relationships" (PMP-RSHIP) and "Self-Transcendence" (PMP-ST) as measures of Altruism. Descriptive analyses showed no difference between Volunteers and Employees in the mean scores of both dimensions. Student's independent sample t-test confirmed

that Volunteers and Employees does not differ in their inclination to “Relationships” (16.17 vs. 15.44, $t=1.002$, $p =.317$) and “Self-Transcendence” (13.65 vs. 12.63, $t=1.270$, $p =.205$) as measures of altruism.

3. DISCUSSION

Results obtained in the present study suggested a positive relationship between psychological distress and post-traumatic growth, albeit of moderate magnitude at best, i.e., higher scores on the DASS-21 total scale are related to higher scores on the PTGI total scale. In more detail, it appears that the increase in Depression is associated with the increase in the Relationship with Others (PTGI-R), the development of New Possibilities (PTGI-NP), and the Appreciation for Life (PTGI-AV) scores inherent to Post-Traumatic Growth; in addition, increasing in Anxiety scores is furtherly related to raising in Personal Strength scores (PTGI-FP) from Post-Traumatic Growth. Concerning the Stress subscale, findings indicated an improving only in scores inherent the Relationship with Others (PTGI-R) and the development of New Possibilities (PTGI-NP) belonging to the Post-Traumatic Growth tool. These results could reveal the presence of a sort of “the more panic, the more coping” phenomenon, in a similar vein with what emerged from a study among Chinese population (Huang, Xu & Liu, 2020). Volunteers can respond effectively not only when they have been exposed to a negative event but the greater the aversive potential of the traumatic event, the greater the resulting change. The finding that volunteers, working in emergency settings, gained positive changes in their approach to life is reported in another study (Belfroid et al., 2018) carried out with a sample of volunteers working in deployable laboratories in West Africa during the Ebola outbreak in which positive experiences that reached far beyond their daily activity, such as a modification in their priorities in life and a greater appreciation of the value of their own lives are reported.

As for the Meaning of Life and psychological Distress, the PMP total score was negatively related to DASS-21 total score, as anticipated by our original hypothesis, but the extent of this correlation is

1 statistically negligible, as well as all the correlations between the PMP and DASS-21 subscales,
2 probably due to the low homogeneity of the sample. Similarly, Schnell and Krampe (2020) found that
3 general mental distress decreased when meaningfulness increased. As for the Meaning of Life and
4 the Post-Traumatic Growth, the PMP total score is positively associated with the PTGI total score,
5 but the extent of this correlation is statistically trivial. However, it was found that Self-Transcendence
6 (PMP-ST), defined as a spiritual lifestyle that directs humans to transcend their own interests to care
7 for others (Wong, 2016), is significantly related to the development of New Possibilities (PTGI-NP).
8 Furthermore, Religion (PMP-R) is significantly connected to the Change in Spirituality (PTGI-SC):
9 it can be seen as a lifestyle that encompasses all deeper dimensions of human experience, not just
10 material ones. Thus, in conditions that may threaten an individual's psychophysical integrity, it seems
11 that one recovers one's faith and spirituality.
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25 Considering the exceptional nature of the current situation, volunteers, notably those whose role is
26 more exposed (e.g., Rescuers and Team leaders) should not be immune from displaying high levels
27 of psychological distress due to both the sudden change in contextual factors - such as increased
28 shifts, change in practices and team structure - and the direct contact with an expanded sense of
29 powerlessness, unpredictability, and uncertainty of human life. Our data have not confirmed the
30 influence of the Role played within the Association, as predicted. Similarly, the Number of shifts is
31 not an influence variable. However, an interesting finding concerned the higher levels of Depression,
32 Anxiety, and Stress for participants who performed fewer shifts during the first pandemic peak. This
33 result could suggest an effect related to the practice and a possible disposition to dehumanization, as
34 a protective strategy, in those who performed more shifts.
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49 As regards the last hypothesis concerning the different propension to altruism between Volunteers
50 and Employees, no statistically significant variations arose from groups. It could be concluded that
51 employees are motivated, in the same manner as volunteers by incentives going beyond mere
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remuneration, which are to be found in dispositions such as pro-sociality or behaviors such as empathy and altruism.

The results obtained in the present study should be considered in the light of some limitations that may have influenced the outcomes. The first shortcoming concerned the sample size: despite the large number of associations contacted, the responses to the survey were not in large numbers. Secondly and due to the sudden occurrence of the disaster, we were unable to assess the individual psychological conditions before the outbreak. Given our correlational design, we cannot ascertain whether. Finally, a key limitation of this investigation was the nature of the data that was based on self-reporting; this potentially can introduce some recall bias into the findings. Moreover, since a convenience sampling method was used to recruit participants, there is also a chance of selection bias.

CONCLUSIONS

Despite the limitations above reported, our study points out the mechanism involved in volunteers' activity and propension highlighting that the post-traumatic growth is more fully understood as related to meaning of life. Interestingly, self-reported distress was associated with an increased post-traumatic growth, and propension to altruism seems to disregard the economic reward. Our experience indicates that meaning of life enabling them to become aware of their own role remaining efficient and focused during stressful events like COVID-19 pandemic. Staff well-being is a critical component for enabling resilience at the institutional and individual levels that can be adequately addressed offering appropriate training and mental health support resources.

AUTHOR CONTRIBUTIONS

OP conceptualized the project and supervised investigation, and statistical analysis revising and editing the original draft of the manuscript. F and M collected and interpreted the data and drafted the manuscript. All authors have read and approved the final version of the paper.

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Table 1. Descriptive statistics of the measures (N=268).

	SCALE RANGE	M	SD	MEAN CI 95%
DASS-21 TOTAL	0-63	10.78	9.17	9.68-11.89
Depression (DASS-21 D)	0-21	3.13	3.58	2.69-3.55
Anxiety (DASS-21 A)	0-21	2.21	2.58	1.89-2.51
Stress (DASS-21 S)	0-21	5.45	4.21	4.94-5.95
PTGI TOTAL	0-105	27.87	21.40	25.29-30.44
Relationships (PTGI-R)	0-35	9.02	7.85	8.07-9.96
New Possibilities (PTGI-NP)	0-25	6.33	5.55	5.66-7.00
Personal Strength (PTGI-PS)	0-20	6.11	4.96	5.51-6.70
Spiritual Change (PTGI-SC)	0-10	1.20	1.96	0.96-1.43
Appreciation of Life (PTGI-AL)	0-15	5.21	3.67	4.76-5.65
PMP TOTAL	0-147	94.25	20.73	91.76-96.74
Achievement (PMP-A)	0-21	14.97	3.88	14.50-15.44
Relationships (PMP-RSHIP)	0-21	16.10	3.59	15.66-16.53
Religion (PMP-R)	0-21	8.19	5.58	7.52-8.86
Self-Transcendence (PMP-ST)	0-21	13.54	3.95	13.06-14.02
Self-Acceptance (PMP-SA)	0-21	13.80	3.66	13.36-14.24
Intimacy (PMP-I)	0-21	14.55	5.70	13.86-15.23
Fair Treatment (PMP-FT)	0-21	13.08	3.77	12.62-13.53

Table 2. Zero-order correlation matrix for all variables (Psychological distress, Post-traumatic growth and Meaning of life tools).

	DASS-21			PTGI					PMP						
DASS-21 TOT				.284**					-.142*						
				PTGI R	PTGI NP	PTGI PS	PTGI SC	PTGI AL	PMP A	PMP RSHIP	PMP R	PMP ST	PMP SA	PMP I	PMP FT
Depression				.283**	.212**	.104	.124*	.206**	-.138*	-.129*	.055	-.077	-.106	-.055	-.136*
Anxiety				.349**	.278**	-.232**	-.124*	.235**	-.076	-.071	-.038	.048	-.188*	-.073	-.074
Stress				.289**	.218**	.156*	.048	.196**	-.114	-.067	-.047	-.004	-.184**	-.096	-.144*
PTGI	.284**								.141*						
Relationships	.283**	.349**	.289**						.085	.113	.096	.153*	.013	-.127*	.150*
New Possibilities	.212**	.278**	.218**						.102	.081	.097	.237**	.011	-.088	.152*
Personal Strength	.104	.232**	.156*						.146*	.105	.108	.252**	.089	-.102	.173**
Spiritual Change	.124*	.124*	.048						.069	-.017	.373**	-.169**	.109	-.078	.105
Appreciation of Life	.206**	.235**	.196**						.080	.050	.143*	.152*	.053	-.065	.137*
PMP	-.142*			.141*											
Achievement	-.138*	-.076	-.114	.085	.102	.146*	.069	.080							
Relationships	-.129*	-.071	-.067	.113	.081	.105	-.107	.050							
Religion	.055	-.038	-.047	.096	.097	.108	.373**	.143*							
Self-Transcendence	-.077	.048	-.004	.153*	.237**	.252**	-.169**	.152*							
Self-Acceptance	-.106	-.188*	-.184**	.013	.011	.089	.109	.053							
Intimacy	-.055	-.073	-.096	-.127*	-.088	-.102	-.078	-.065							
Fair Treatment	-.136*	-.074	-.144*	.150*	.152*	.173**	.105	.137*							

** p<.01; * p<.05

Abbreviations: DASS, Depression, Anxiety and Stress Scale; PTGI, Post Traumatic Growth Inventory; PMP, Personal Meaningful Profile.

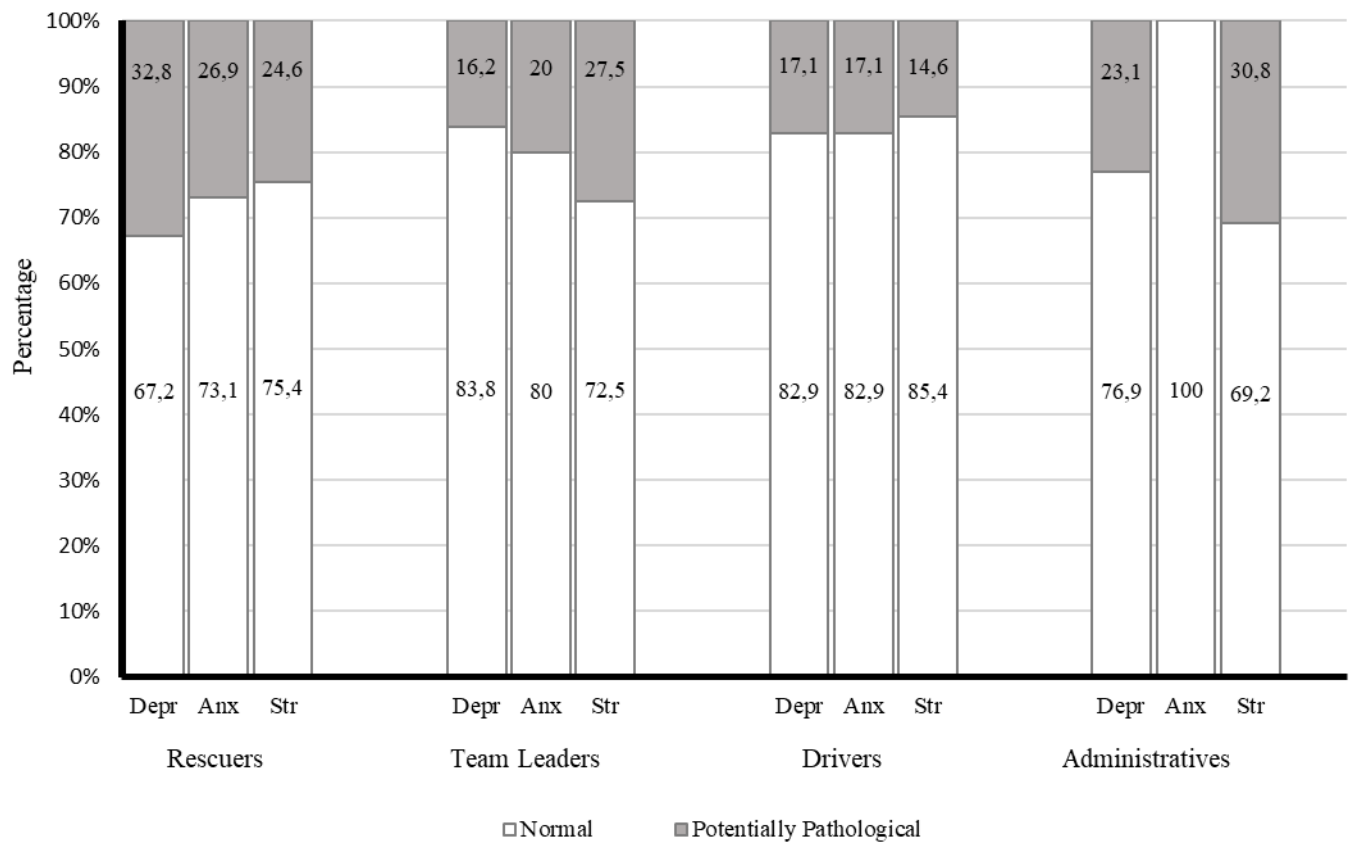
Table 3. Prevalence (Mean and \pm SD), predictors of distress among Role played in the Association and measures of association (Chi-squared test)

DASS-21	Mean (\pm SD)				Chi-squared	
	Team leaders (N= 80)	Rescuers (N= 134)	Drivers (N=41)	Administrative s (N= 13)	χ^2	p-value
Depression	2.44 (\pm 3.18)	3.69 (\pm 3.86)	2.73 (\pm 3.36)	2.77 (\pm 2.83)	9.05	.029 (a)
Anxiety	1.90 (\pm 2.24)	2.59 (\pm 2.69)	1.85 (\pm 2.95)	1.31 (\pm 1.31)	6.28	.099
Stress	5.50 (\pm 4.14)	5.78 (\pm 4.27)	4.32 (\pm 4.26)	5.38 (\pm 3.45)	2.83	.418
Total	9.83 (\pm 8.52)	12.05 (\pm 9.58)	8.90 (\pm 9.44)	9.46 (\pm 6.22)	2.19	.053

(a) Because of cell quantiles not exceeded |1.96|, this value can be considered not significant.

Table 4. Prevalence (Mean and \pm SD) and predictors of distress among number of shifts played in the Association during COVID_19 outbreak and Chi-squared test.

DASS-21	Mean (\pm SD)					Chi-squared	
	0-5 shifts (N= 45)	5-10 shifts (N= 39)	10-15 shifts (N= 40)	15-20 shifts (N= 46)	>20 shifts (N= 61)	χ^2	p-value
Depression	3.44 (\pm 3.52)	2.49 (\pm 2.76)	3.08 (\pm 3.81)	3.09 (\pm 3.98)	2.93 (\pm 3.81)	4.21	.37
Anxiety	2.64 (\pm 2.74)	1.97 (\pm 2.48)	1.88 (\pm 2.42)	1.83 (\pm 2.47)	2.31 (\pm 2.72)	2.79	.59
Stress	5.84 (\pm 4.13)	5.00 (\pm 4.49)	5.50 (\pm 3.69)	4.48 (\pm 3.98)	5.39 (\pm 4.28)	4.60	.33
Total	10.75 (\pm 9.19)	10.69 (\pm 9.07)	10.67 (\pm 9.12)	10.78 (\pm 9.17)	10.69 (\pm 9.11)	1.20	.87

FIGURE 1. Prevalence of depression, anxiety and stress stratified by role.

Abbreviations: Depr, Depression; Anx, Anxiety; Str, Stress.